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PATENT ABSTRACTS OF JAPAN

(11)Publication number : 10-003568

(43)Date of publication of application : 06.01.1998

(51)Int.Cl.

G07F 7/08

G07F 7/12

G07G 1/12

(21)Application number : 08-153673

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(22)Date of filing : 14.06.1996

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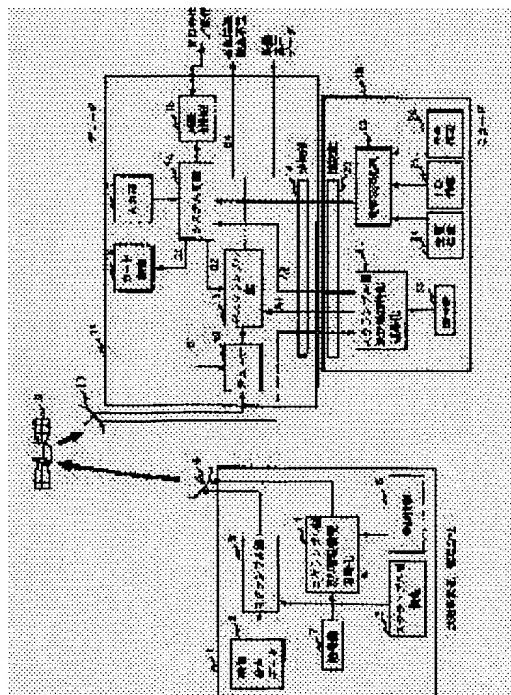
AYUSAWA IWAO

(54) ELECTRONIC PURSE APPLICATION SYSTEM AND TRANSACTION DEVICE USING IC CARD

(57)Abstract:

PROBLEM TO BE SOLVED: To limit a broadcasting program for minority, and to prevent the sales of liquor or cigarettes or the like to minority.

SOLUTION: An electronic purse system using an IC card 19 is applied, and a sun information 24 and an age information 26 of the owner of an IC card 19 are stored in the IC card 19. Thus, when operating transaction in which it is necessary to limit transaction with minority, a decoder 11 side identifies the age information 26 of the card owner, and inhibits the transaction when the card owner is judged as the minority. Thus, the age limitation in the transaction can be realized.



LEGAL STATUS

[Date of request for examination] 05.06.2003
[Date of sending the examiner's decision of rejection] 27.04.2004
[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]
[Date of final disposal for application]
[Patent number]
[Date of registration]
[Number of appeal against examiner's decision of rejection] 2004-11029
[Date of requesting appeal against examiner's decision of rejection] 27.05.2004
[Date of extinction of right]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] In case this invention performs a commercial transaction using a smart card system, it relates to the smart card application system which gave an owner's age information with cybermoney information in the IC card.

[0002]

[Description of the Prior Art] Although settlement of accounts is performed by cash with the automatic vending machine of alcohol or tobacco now, since sale cannot be stopped when minors try to purchase, it is coping with stopping sale at night etc. Moreover, although the tariff of the program which the viewer chose is charged directly to a bank in pay TV broadcast with CS broadcasting, CATV, etc. using a credit card, in order that a child may prevent from watching the program for adults also in this case, it is coping with making a personal identification number input etc. however, the above -- neither of the cases can prevent the sale to minors completely.

[0003] On the other hand, perfect CHASSHURESU-ization of a commercial transaction is considered by the smart card system which used the IC card as indicated by JP,3-92966,A. This is the system which can make a commercial transaction complete by writing in the amount-of-money information specified as the memory in an IC card by arbitration, and transmitting required amount-of-money information from an IC card at the time of settlement of accounts, without using cash.

[0004]

[Problem(s) to be Solved by the Invention] When the commercial transaction by this smart card system is realized, in an IC card, it becomes possible to give the individual humanity news of cardholders, such as age, with cybermoney information. Therefore, it becomes possible by identifying this age information at the time of settlement of accounts to prevent the sale to minors automatically. Moreover, this invention is applicable also to settlement of accounts in case tariffs differ by the adult and the child like admission fees, such as fares, such as a railroad and a bus, and a theater.

[0005]

[Means for Solving the Problem] The IC card which stores age information, such as age of cybermoney information and an IC card owner, or a birth date, in this invention in order to attain the above-mentioned purpose, The IC card R/W means which writes in by reading the information on this IC card, The IC card control means which controls wearing and discharge of this IC card, and an input means to choose goods, It constitutes from an automatic dealings terminal unit which has a proceeds frame information storage means to store the cybermoney information equivalent to the amount-of-money value of these goods, the goods ejection control means which controls the ejection of these goods, and a data-processing means to judge the propriety of sale of these goods.

[0006] And as a result of judging with this data-processing means, while only a case reduces the cybermoney which is equivalent to the amount-of-money value of these goods from this IC card of the age for which the age information of the owner of this IC card wishes and which can sell goods and storing it in this proceeds frame information storage means considerable the bottom at it, these goods are

picked out from this automatic dealings terminal unit by this goods ejection control means.

[0007] As mentioned above, in this invention, it becomes possible by giving a cardholder's age information with cybermoney information in an IC card to identify this age information and to perform tariff settlement of accounts at the time of a commercial transaction. Therefore, it becomes possible to prevent the sale to minors, such as alcohol and tobacco. Moreover, when the age of the time of the insufficient funds of a viewer's IC card or an IC card owner starts an age limit of a program, discharge of a scramble can be automatically interrupted for pay TV broadcast. Furthermore, it is applicable like admission fees, such as fares, such as a railroad and a bus, and a theater, also at the time of settlement of accounts in case tariffs differ by the adult and the child.

[0008]

[Embodiment of the Invention] The example of this invention is explained using drawing 1 - drawing 9.

[0009] Drawing 1 is one example of the pay TV broadcast system which used this invention, and is the system which dedicated the amount-of-money information for performing tariff settlement of accounts with the cryptographic key information for canceling the scramble of an image, voice, and a data signal to the IC card of one sheet. Moreover, by using the information on the age limit sent to coincidence by pay TV broadcast, while giving age information, such as an owner's age or a birth date, to the above-mentioned IC card in this system, when the time of insufficient funds and a child try to watch the program for adults, it is possible to carry out by the ability not using the above-mentioned cryptographic key automatically. Consequently, a scramble is not canceled and a viewer cannot watch the program.

[0010] 1 an image, voice, a data signal bank, and 3 for a broadcast entrepreneur, a commissioned company, and 2 The scramble section, A scramble key and the encryption section of program information, and 5 4 The scramble key information storage section, In 6, the program information storage section and 7 a transmitting antenna and 9 for the cryptographic key storage section and 8 A communication satellite, In 10, a receiving antenna and 11 the tuner section and 13 for the decoder section and 12 The descrambling section, 14 the line control section and 16 for the system control section and 15 An IC card control section, 17 -- the input section and 18 -- a connection and 19 -- an IC card and 20 -- for the cryptographic key storage section and 23, as for the amount-of-money information storage section and 25, the amount-of-money settlement-of-accounts processing section and 24 are [a connection and 21 / a scramble key and the decryption section of program information, and 22 / ID information storage section and 26] the age information storage sections.

[0011] In addition, in this example, although information is transmitted to the viewer from the broadcast entrepreneur using a communication satellite, the broadcast using cables by ground waves, such as VHF and UHF, such as broadcast and CATV, is sufficient.

[0012] First, the detail by the side of a broadcast entrepreneur and a commissioned company is explained. The image transmitted to a viewer, voice, and a data signal are outputted from the data bank 2, and are enciphered in the scramble section 3. In this case, each signal is enciphered under the regulation defined beforehand with the scramble key stored in the scramble key information storage section 5.

[0013] Moreover, program information stored in the program information storage section 6 with this scramble key, such as program guidance and contract information, is enciphered in the encryption section 4 of a scramble key and program information. Also in this case, it is enciphered under a fixed regulation by the cryptographic key stored in the cryptographic key storage section 7 in the case of encryption. In addition, when the program to transmit has an age limit, the information on an age limit is enciphered as the above-mentioned program information.

[0014] It is transmitted to a communication satellite 9 by the transmitting antenna 8, and these enciphered data are broadcast again from a communication satellite after that at a viewer side.

[0015] Next, the detail by the side of a viewer is explained. By inserting IC card 19 in a decoder 11, a viewer becomes possible [receiving service]. First, it is received by the receiving antenna 10 and the various data transmitted from the communication satellite are supplied to a decoder 11. Although the data enciphered in the scramble section 3 in this are processed in the tuner section 12, the data

enciphered in the encryption section 4 of a scramble key and program information are processed in the scramble key in an IC card, and the decryption section 21 of program information.

[0016] In addition, in the case of processing, it is decrypted under the regulation defined by the cryptographic key in the decryption section 21 stored in the cryptographic key storage section 22. Since package management of this cryptographic key is done by the commissioned company, the viewer who has not done the commissioned company and the contract cannot decrypt data in the decryption section 21.

[0017] Although scramble key information is supplied to the descrambling section 13 in the data decrypted in the decryption section 21 of a scramble key and program information (A1), after data, such as program guidance and contract information, are supplied to the system control section 14, they are outputted from (A2) and a decoder and are displayed on (B4) and the screen of TV. Moreover, when the information on an age limit is in a program, this data is also supplied to the system control section 14 (A2).

[0018] If the program which a viewer wants to watch with this program guidance is chosen and it chooses in the input section 17, only the program which (B1) and a viewer chose with the control signal outputted from the system control section 14 will be extracted in the tuner section 12, and data will be supplied to the descrambling section 13. Since this data is decrypted under a fixed regulation with a scramble key and is outputted from a decoder 11, a viewer can enjoy the program chosen by TV etc.

[0019] Here, the tariff settlement of accounts in the case of program reception is explained. If the storage section 24 of amount-of-money information is in IC card 19 and a viewer agrees on a program for paying at the time of selection, a tariff will be automatically charged directly to the storage section 24, and the cybermoney information will be remitted to a commissioned company or a bank through the amount-of-money settlement-of-accounts processing section 23, the system control section 14, and the line control section 15.

[0020] By the way, when the tariff clearing time runs short of the balance in an IC card, a control signal is supplied to the system control section 14 from the amount-of-money settlement-of-accounts processing section 23. moreover, data, such as an age limit of the selected program, are supplied to the system control section 14 from the decryption section 21 of a scramble key and program information -- having (A2) -- an IC card owner's age information stored in the age information storage section 26 is supplied to the system control section 14 from the amount-of-money settlement-of-accounts processing section 23. Therefore, when the program which the time of the insufficient funds of an IC card and a viewer chose starts an age limit, a decryption in the descrambling section 13 is automatically forbidden by the control signal (B-2) outputted from the system control section 14, and a viewer cannot watch the program. In addition, in this case, since the system control section 14 outputs a control signal (B3), IC card 19 is automatically discharged by the card control section 16, and processing is completed.

[0021] The actuation flow by the side of the viewer in the above-mentioned example is shown in drawing 2. The detail of the above-mentioned tariff settlement of accounts or an age limit is explained using this.

[0022] If a viewer inserts IC card 19 in a decoder 11 (S101), the menu of a program will be displayed on TV screen (S102). Then, selection of a program to watch displays a tariff on TV screen (S104). (S103) Here, if a viewer agrees with payment of a tariff (S105), the balance in an IC card will be read (S106). Next, although a judgment whether payment of a tariff is possible is made in the amount-of-money settlement-of-accounts processing section 23 with this balance value (S107), when payment is not completed, after the display of insufficient funds is outputted from the system control section 14, (S115) and an IC card are discharged (S113), and processing is completed.

[0023] On the other hand, when payment is possible next, the age information in an IC card is read (S108). Then, although a judgment whether an age limit of the program which a viewer's age chose is started is made in the system control section 14 (S109), when not starting an age limit, after the balance of an IC card is updated, data are decrypted in (S110) and the descrambling section 13, and a scramble is canceled (S111). Moreover, when starting an age limit, after the purport to which it cannot view and listen because of an age limit is displayed on TV screen, (S116) and an IC card are discharged (S113),

and processing is completed.

[0024] Termination of a program outputs the display of whether to view and listen continuously to TV screen (S112). Here, although the menu of a program is again displayed when viewing and listening continuously (S102), when not viewing and listening, an IC card is discharged (S113), and processing is completed.

[0025] As mentioned above, by dedicating an IC card owner's age information to the IC card of one sheet with the amount-of-money information for performing tariff settlement of accounts with the cryptographic key information for canceling the scramble of an image, voice, and a data signal, when the age of the time of insufficient funds or a cardholder starts an age limit of a program, discharge of a scramble can be automatically interrupted for this example.

[0026] In addition, although a tariff is exchanged between a viewer's IC card and the IC card of a commissioned company or a bank, you may make it store once the cybermoney which prepared the IC card and was remitted into the decoder 11 in a decoder in the above-mentioned example. Moreover, although the information on an age limit of the selected program has been sent as program information, it may be added to the output signal of an image, voice, and the data signal bank 2. In this case, it considers as the configuration which supplies only the information on an age limit to the system control section 14 from the data outputted from the descrambling section 13, and outputs other images, voice, and a data signal to a buffer from a decoder 11 after storing once. Therefore, when it cannot view and listen with an age limit, the output from a decoder 11 can be stopped by stopping actuation of the above-mentioned buffer with the control signal from the system control section 14.

[0027] Next, one example of the automatic vending machine which used this invention is shown in drawing 3. Also in this case, a tariff is settled using the amount-of-money information in an IC card. Moreover, in the automatic vending machine of alcohol or tobacco, it becomes possible to stop the sale to minors automatically by using a cardholder's age information stored in the IC card.

[0028] 30 -- an IC card and 31 -- the amount-of-money information storage section and 32 -- ID information storage section and 33 -- the age information storage section and 34 -- the amount-of-money settlement-of-accounts processing section and 35 -- a connection and 36 -- an automatic vending machine and 37 -- a display and 38 -- for the amount-of-money settlement-of-accounts processing section and 41, as for a card control section and 43, the line control section and 42 are [the input section and 39 / a connection and 40 / the proceeds frame storage section and 44] goods ejection control sections.

[0029] Here, the automatic vending machine of alcohol is explained to an example. When a visitor inserts IC card 30 in an automatic vending machine 36 and chooses the goods of hope by the input section 38, a tariff is charged directly to the amount-of-money information storage section 31 in an IC card, and the cybermoney information is stored in the proceeds frame storage section 43 in an automatic vending machine. Then, this proceeds frame is remitted to a commissioned company, a bank, etc. through the line control section 41.

[0030] In addition, since a control signal (A2) is supplied to the goods drawing control section 44 when the tariff clearing time runs short of the balance in an IC card, or when the age information stored in the age information storage section 33 starts an age limit of goods, the ejection of goods is stopped automatically. Moreover, since a control signal (A1) is supplied also to the card control section 42 while the purport of a dealings termination is displayed on a display 37 in this case, IC card 30 is automatically discharged by the card control section 42, and processing is completed.

[0031] The actuation flow of the visitor in the above-mentioned example is shown in drawing 4. The detail of the above-mentioned tariff settlement of accounts or an age limit is explained using this.

[0032] If a visitor chooses the goods to purchase by the input section 38 after inserting IC card 30 in an automatic vending machine 36 (S201) (S202), a tariff will be displayed on a display 37 (S203). Here, if a visitor agrees with payment of a tariff (S204), the balance in an IC card will be read (S205). Then, although a judgment whether payment of a tariff is possible is made in the amount-of-money settlement-of-accounts processing section 40 with the read balance value (S206), when payment is not completed, after the display of insufficient funds is outputted (S214), an IC card is discharged (S212) and

processing is completed.

[0033] On the other hand, when payment is possible next, the age information in an IC card is read (S207). Here, although a judgment whether an age limit of the goods which a visitor's age chose is started is made in the amount-of-money settlement-of-accounts processing section 40 (S208), when not starting an age limit, after the balance of an IC card is updated, (S209) and the purchased goods are taken out (S210). Then, although goods are again chosen when purchasing continuously (S202), when not purchasing, an IC card is discharged (S212), and processing is completed. Moreover, when starting an age limit, after the purport which cannot be sold because of an age limit is displayed, (S215) and an IC card are discharged (S212), and processing is completed.

[0034] When the time of insufficient funds and minors try to purchase alcohol, sale is automatically stopped by the automatic vending machine of for example, alcohol by the above.

[0035] Next, the example of others of an automatic vending machine which used this invention is shown in drawing 5. 45 is the ticket issue section.

[0036] Admission tickets, such as a theater and an amusement park, become possible [identifying a visitor automatically and collecting a tariff] in this invention, although tariffs differ by the child and the adult. In addition, although paid by inserting IC card 30 in an automatic vending machine 36 in this example, also in the system which performs tariff settlement of accounts, this invention can be carried out only by passing through the gate using a non-contact IC card.

[0037] The actuation flow of the visitor in the above-mentioned example is shown in drawing 6. The detail of the above-mentioned tariff settlement of accounts is explained using this.

[0038] If a visitor inserts IC card 30 in an automatic vending machine 36 (S301), the age information 33 in an IC card will be read first (S302). Using this age information, the amount-of-money settlement-of-accounts processing section 40 calculates the tariff which a cardholder pays, and displays that tariff on a display 37 (S303). If it agrees with payment of the tariff as which the visitor was displayed (S304), the balance of an IC card will be read next (S305). Then, although a judgment whether payment of a tariff is possible is made in the amount-of-money settlement-of-accounts processing section 40 with the read balance value (S306), when payment is not completed, after the display of insufficient funds is outputted (S311), an IC card is discharged (S309) and processing is completed.

[0039] On the other hand, when payment is possible, after the balance of an IC card is updated, an entrance (S307) ticket is published (308). Then, an IC card is discharged (S309) and processing is completed.

[0040] In addition, although one ticket of an IC card owner can be purchased in the above-mentioned example, in purchasing two or more tickets, it becomes possible by specifying number of sheets by the input section 38.

[0041] Next, one example of renewal of the age information in an IC card is explained using drawing 7. Although information, such as an owner's concrete age or his teens, and his twenties, is memorized in the age information storage section in an IC card, in order to protect an owner's privacy, the information on a birth date shall not be memorized by this example. On the other hand, in case an account is established in a bank, in order to register individual humanity news, such as a birth date, into a bank side, in the example of drawing 7, collating and updating of a card of age information are performed in a bank at the time of access.

[0042] The case where an IC card receives cybermoney is explained to an example. If a card is inserted in ATM of a bank or (S401) a bank is accessed using the telephone line, first, a personal identification number will be inputted (S402) and the inputted personal identification number will be displayed (S403). Next, an input of the amount of money pulled out from a bank account displays the amount of money (S405). (S404)

[0043] Here, when collating of the above-mentioned personal identification number and the personal identification number registered into the bank is performed (S406) and it is not in agreement, an IC card is discharged (S411), and processing is completed. Moreover, after a judgment whether the drawer from an account is possible was made (S407), and the balance of an IC card and the balance of a bank account are updated when money can be invested when in agreement, (S408) and the age information on an IC

card are read (S409). On the other hand, when money cannot be invested, after the purport which runs short of the balance of an account is displayed, (S413) and an IC card are discharged (S411), and processing is completed.

[0044] If the age information on an IC card is read, collating with the information on an owner's birth date registered into the bank starts, and only when correction is required, the age information on an IC card will be updated (S410). Then, an IC card is discharged and processing (S411) ends it.

[0045] As for the age information of the owner in an IC card, correction is made on a bank by the above only at the time of access. In addition, the information on a birth date is given to an IC card, and it may always be made to perform collating and updating of age to the device which contains the clock like ATM of a bank, or the POS terminal of a store at the time of access.

[0046] On the other hand, altering unjustly will also be considered if updating of the age information on an IC card is enabled as mentioned above. Then, although carried out to the ability of the age information on an IC card not to be updated, you may make it update an owner's age information by giving a term to the IC card itself at the time of card renewal.

[0047] Next, one example of an exchange of the data between IC cards is explained using drawing 8. In this case, in the IC card, the master data, such as an ID number, *****, and age, and amount-of-money data, such as the amount of money and coding information (cryptographic key), are stored. When delivering and receiving cybermoney between IC cards, it pays first, exchange of the above-mentioned master data is performed between receiving areas a side, and a check of a dealings partner etc. is performed (A). Then, information, such as the remittance amount of money of cybermoney, is enciphered using a cryptographic key, the enciphered data pays, and it is exchanged between receiving areas a side (B).

[0048] Since an owner's age information is also surely transmitted by the above when delivering and receiving the amount of money, it becomes possible to perform age limit, tariff discernment, etc. automatically based on this age information. In addition, age information may be added to the ID number of an IC card itself, without storing the data of an ID number and age separately as mentioned above.

[0049] Finally, drawing 9 is used and other storing approaches of age information are explained. In the example of drawing 1 - drawing 8, a cardholder's age information was stored in the IC card, at the time of a commercial transaction, the IC card was accessed and age was collated. However, it is also possible to collate age information by storing a cardholder's age information in a bank or a commissioned company, and accessing a bank and a commissioned company if needed at the time of a commercial transaction. In the case of the pay TV broadcast system shown in drawing 9, a cardholder's age information is supplied to the line control section 15 from a bank or a commissioned company through a circuit. Then, since this age information is supplied to the system control section 14, it becomes possible [stopping actuation of the descrambling section 13 if needed].

[0050] In this case, since an owner's individual humanity news is not stored in an IC card, it becomes possible to protect a cardholder's privacy at the time of IC card loss. Moreover, since a cardholder's information can be changed at any time, it can perform adding various data besides a cardholder's age information, for example, preventing the unauthorized use at the time of card loss, suspending use of a card immediately, when the person who appeared in the blacklist tries to use a card, etc. Moreover, various kinds of premium services can also be offered to the good customer who uses a card frequently by memorizing a cardholder's card operating condition to a bank or a commissioned company.

[0051] Moreover, the classification of the license which a user holds instead of age information etc. may be stored in an IC card etc. thus -- rubbing -- dealings with an IC card are attained by goods [the time of purchase] to be permitted [specific].

[0052]

[Effect of the Invention] According to this invention, it becomes possible by giving a cardholder's age information with cybermoney information in an IC card to identify this age information and to perform tariff settlement of accounts at the time of a commercial transaction. Therefore, when the age of the time of the insufficient funds of a viewer's IC card or an IC card owner starts an age limit of a program,

discharge of a scramble can be automatically interrupted for pay TV broadcast. Moreover, it also becomes possible to prevent the sale to minority, such as alcohol and tobacco. Furthermore, it is applicable also at the time of settlement of accounts of admission fees, such as fares, such as a railroad and a bus, and a theater.

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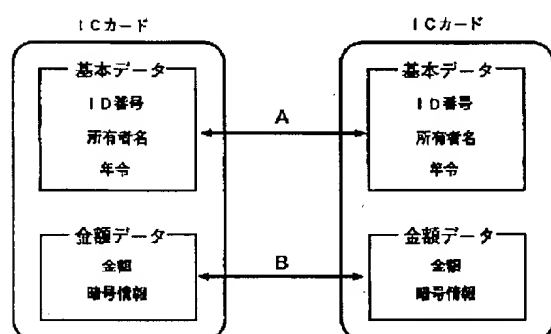
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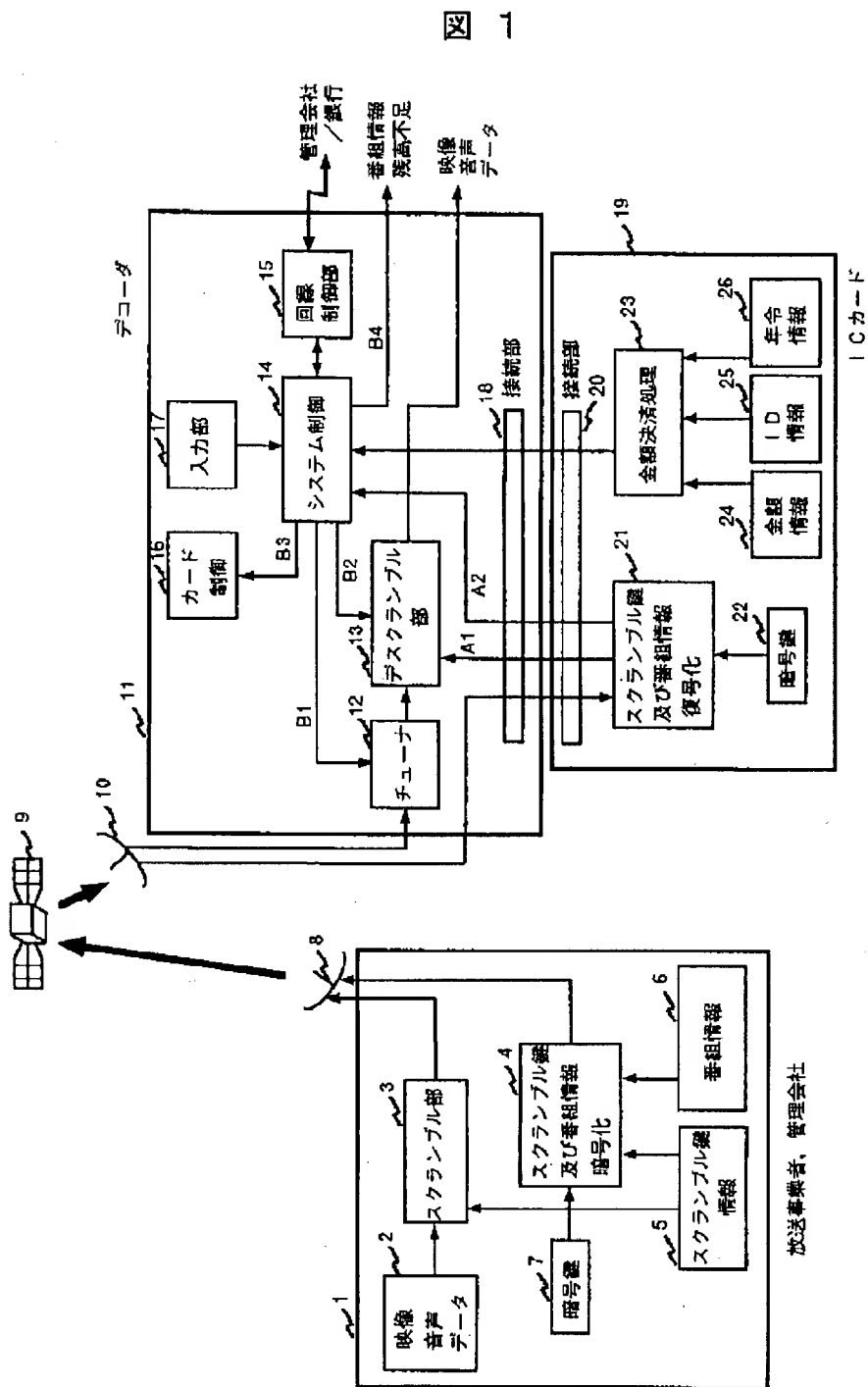
DRAWINGS

[Drawing 8]

図 8

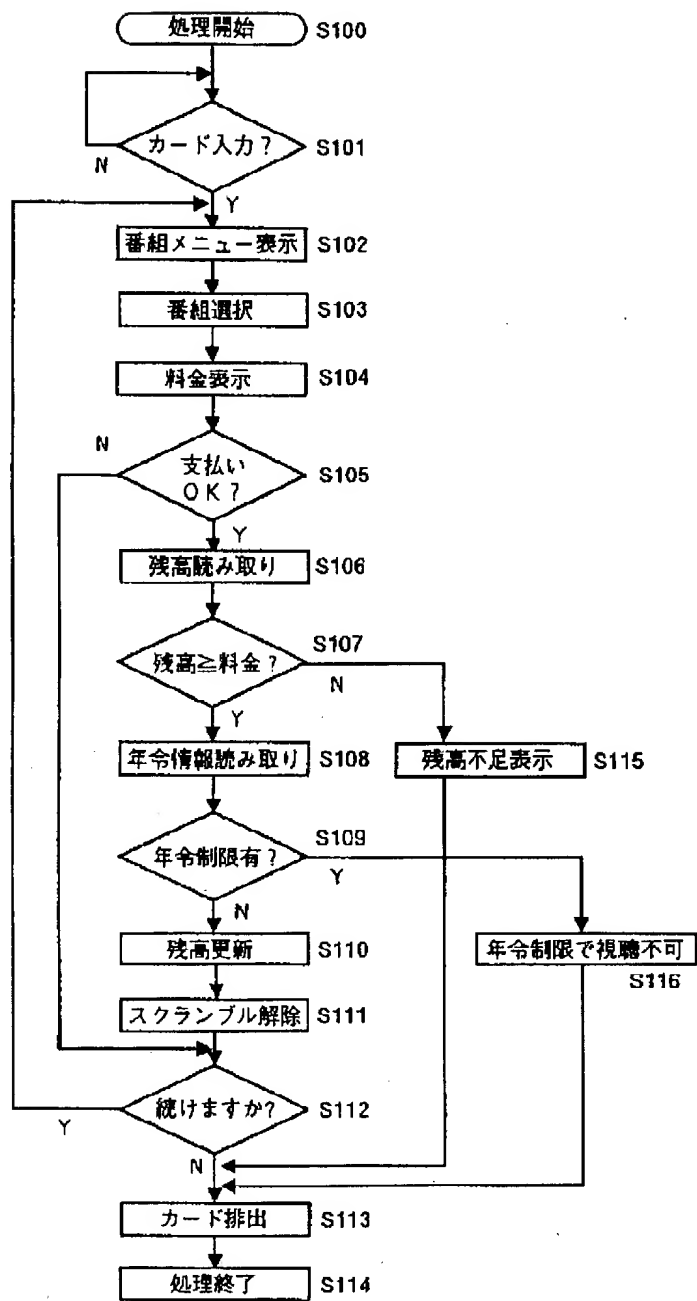


[Drawing 1]



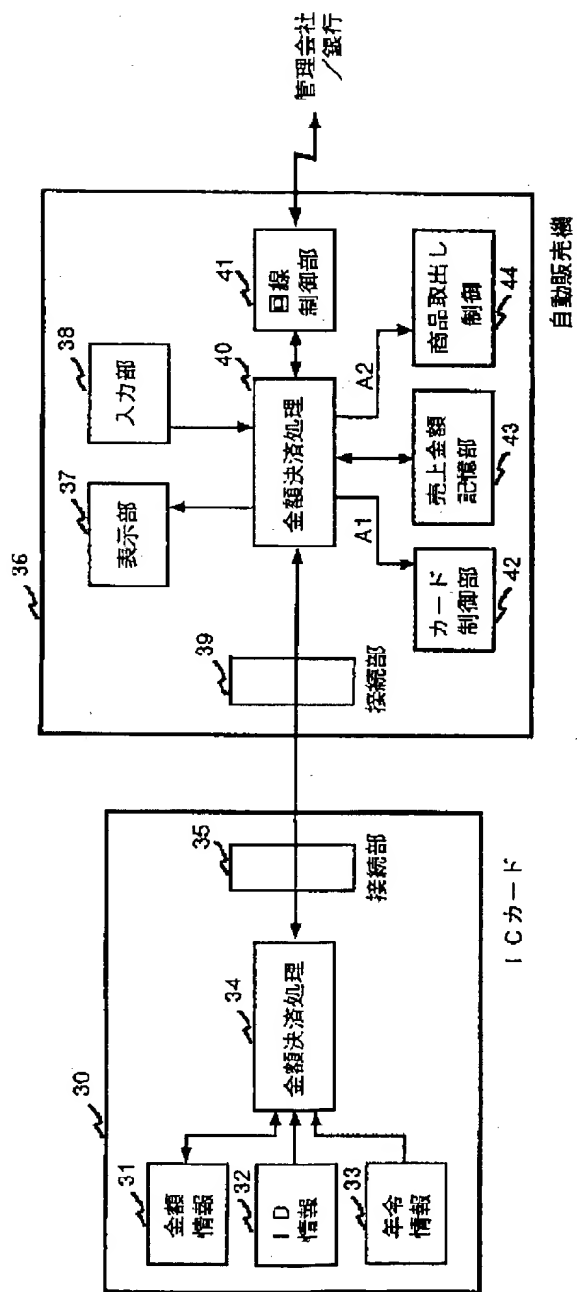
[Drawing 2]

図 2



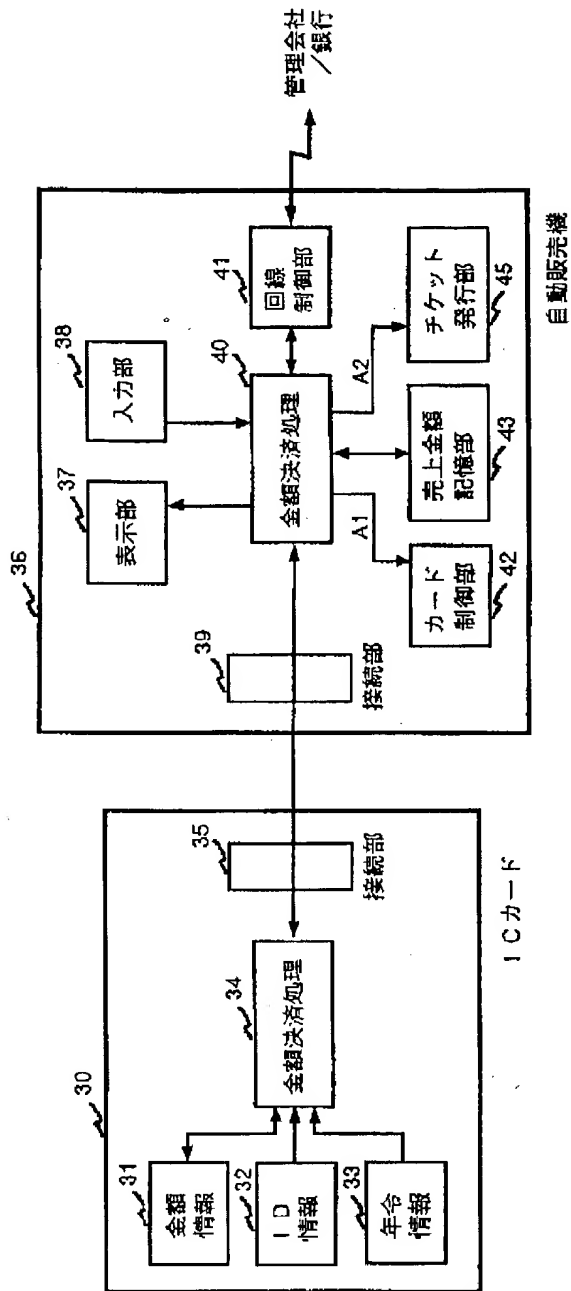
[Drawing 3]

図 3



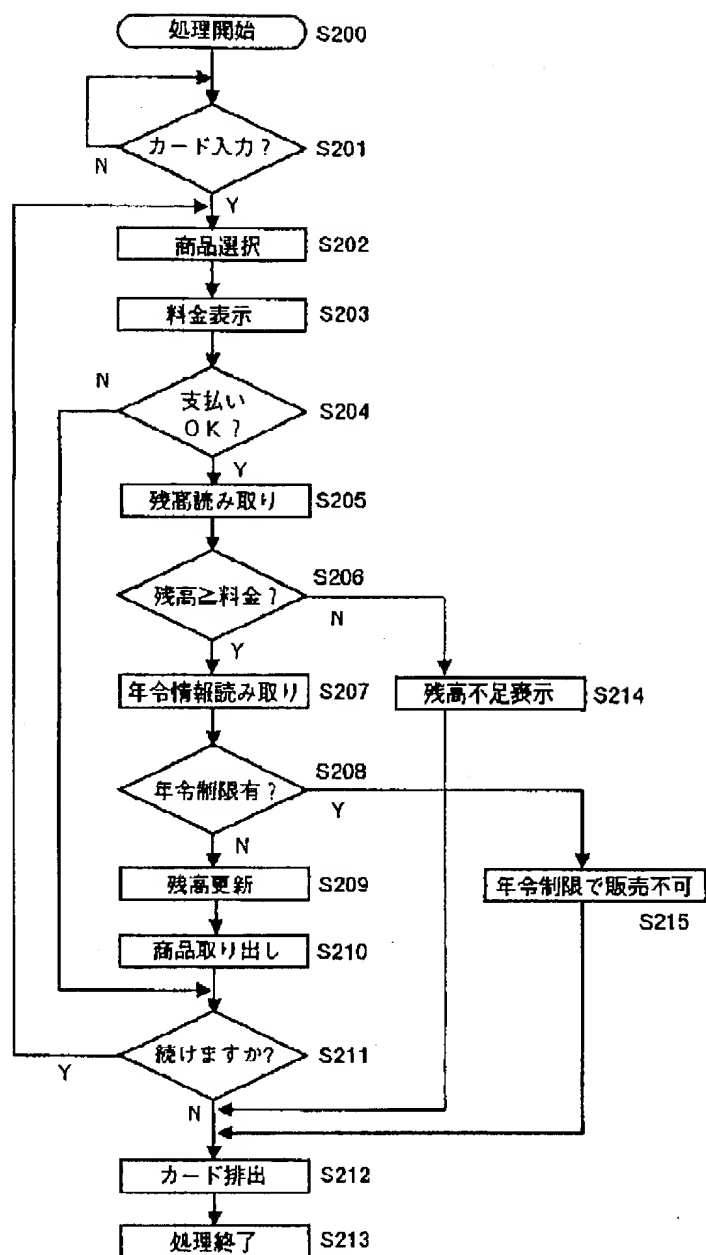
[Drawing 5]

図 5



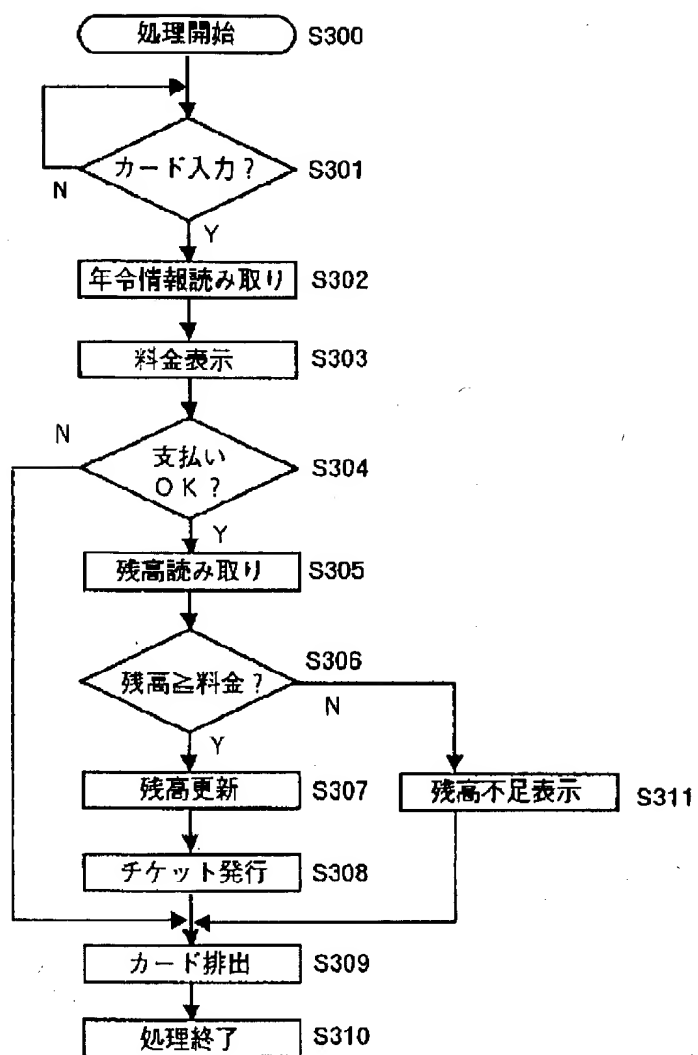
[Drawing 4]

図 4



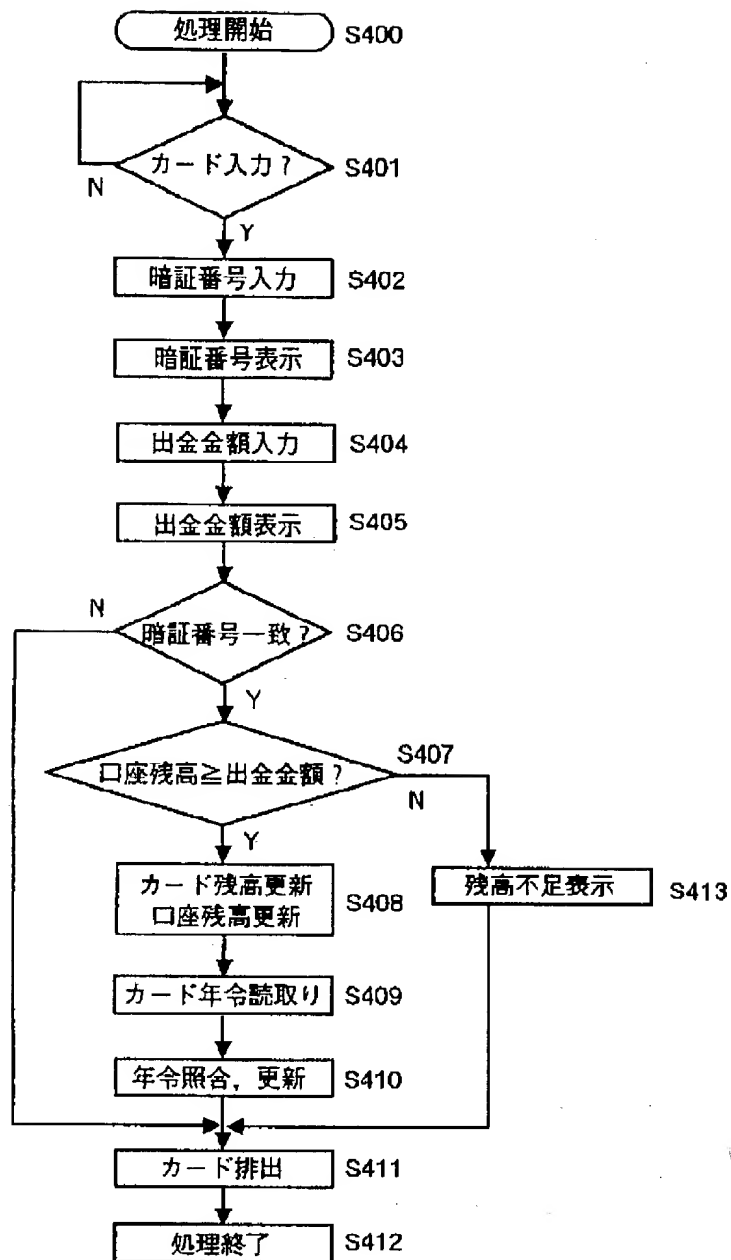
[Drawing 6]

図 6



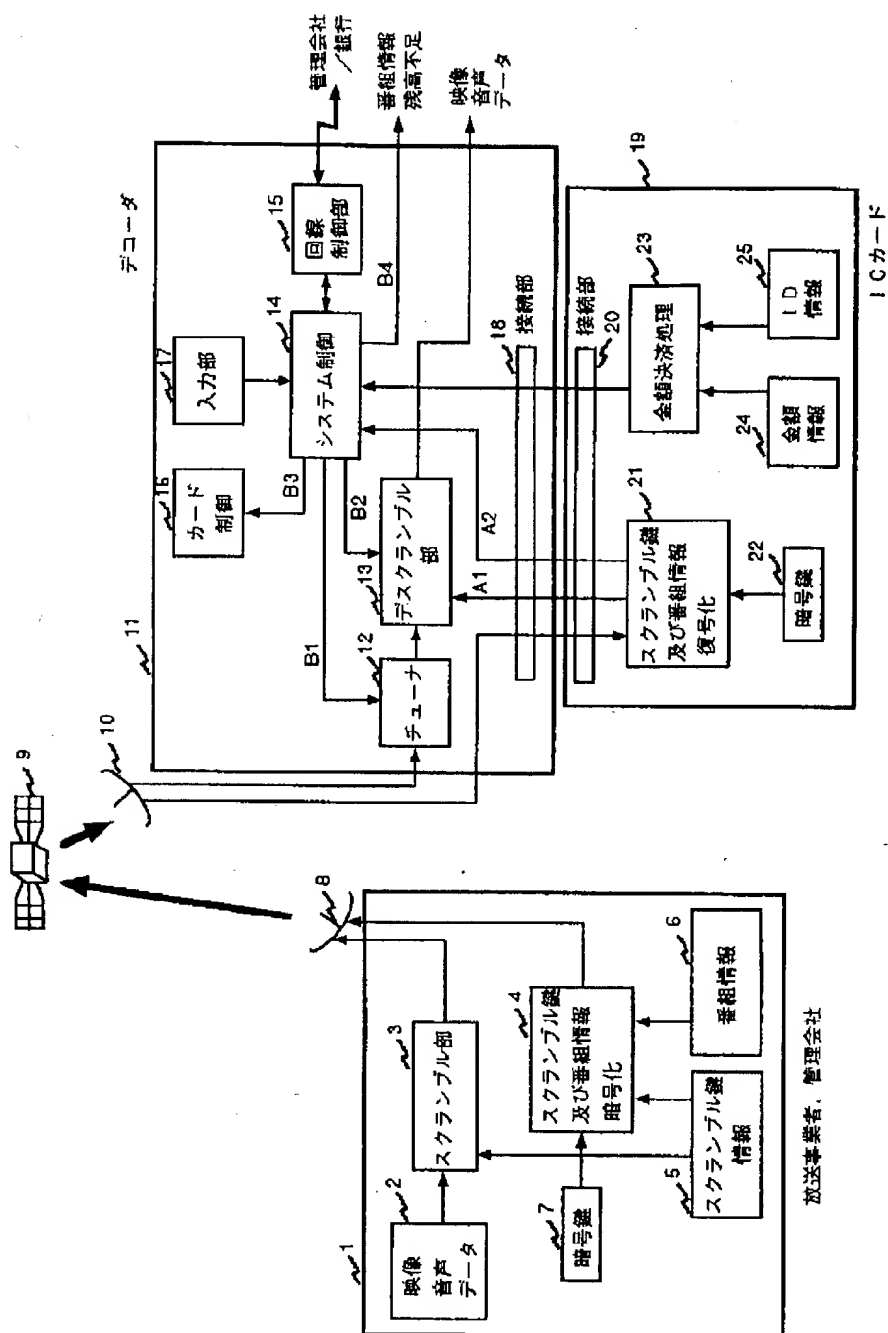
[Drawing 7]

図 7



[Drawing 9]

図 9



[Translation done.]